

WHAT IS CLAIMED IS:

1 1. A method for introducing fluid into a fluid system comprising:
2 filling a container with a fluid;
3 attaching the container to a fluid delivery apparatus;
4 transferring a fluid from the container into a cavity of the fluid delivery apparatus,
5 thereby reducing pressure in the container;
6 introducing the fluid from the cavity into the fluid system; and
7 equalizing pressure within the container to ambient pressure.

1 2. The method of claim 1, wherein attaching the container to the fluid delivery
2 apparatus includes threadably connecting the container to a threaded input port of the fluid
3 delivery apparatus.

4 3. The method of claim 2, wherein the threaded input port is threaded at a thread
5 density of 8 threads per inch, and has an inner diameter of 22 mm and a thread diameter of
6 24.1 mm.

7 4. The method of claim 1, wherein the container includes a neck, the neck having a
8 thread density of 8 threads per inch, a pitch of 3.18 mm, a helix angle of $2^{\circ}34'$, an outer
9 orifice diameter of 21.5 mm, and a thread diameter of 23.7 mm.

1 5. The method of claim 1, wherein the container has a neck designated as the Society
2 of Plastics Industry designation of 24-410.

1 6. The method of claim 1, wherein the container is a cylindrical bottle.

1 7. The method of claim 1, wherein the container has an eight fluid ounce nominal
2 capacity.

1 8. The method of claim 1, wherein the container has a four fluid ounce nominal
2 capacity.

1 9. The method of claim 1, wherein the container has a two fluid ounce nominal
2 capacity.

1 10. The method of claim 1, wherein the fluid delivery apparatus comprises a pressure
2 valve to equalize pressure in the container.

1 11. The method of claim 1, wherein the fluid includes a dye.

1 12. The method of claim 11, where the dye is a naphthalimide.

1 13. The method of claim 1, wherein the fluid includes a lubricant.

1 14. The method of claim 1, wherein the fluid system is a heating, ventilating, or air
2 conditioning system.

1 15. The method of claim 1, wherein ambient pressure is atmosphere pressure.

2 16. A method for introducing fluid into a heating, ventilating, or air conditioning
3 system comprising:

4 filling a container with a fluid including a dye;

5 attaching the container to a fluid delivery apparatus, the fluid delivery apparatus
6 including:

7 a body having a cavity, an output port fluidly connected to the cavity, an input
8 port fluidly connected to the cavity by a channel, and a piston orifice
9 fluidly connected to the cavity;

10 a piston extending into the cavity through the piston orifice;

11 an intake valve within the channel;

12 an output valve proximate to the output port; and

13 a pressure valve between the intake valve and the input port;

14 transferring a fluid from the container into a cavity of the fluid delivery apparatus,
15 thereby reducing pressure in the container;

16 introducing the fluid from the cavity into the fluid system; and

17 equalizing pressure within the container to ambient pressure.

1 17. The method of claim 16, wherein attaching the container to the fluid delivery
2 apparatus includes threadably connecting the container to a threaded input port of the fluid
3 delivery apparatus.

4 18. The method of claim 17, wherein the threaded input port is threaded at a thread
5 density of 8 threads per inch, and has an inner diameter of 22 mm and a thread diameter of
6 24.1 mm.

7 19. The method of claim 16, wherein the container includes a neck, the neck having a
8 thread density of 8 threads per inch, a pitch of 3.18 mm, a helix angle of $2^{\circ}34'$, an outer
9 orifice diameter of 21.5 mm, and a thread diameter of 23.7 mm.

1 20. The method of claim 16, wherein the container has a neck designated as the
2 Society of Plastics Industry designation of 24-410.

1 21. The method of claim 16, wherein the container is a cylindrical bottle.

1 22. The method of claim 16, wherein the container has an eight fluid ounce nominal
2 capacity.

1 23. The method of claim 16, wherein the container has a four fluid ounce nominal
2 capacity.

1 24. The method of claim 16, wherein the container has a two fluid ounce nominal
2 capacity.

1 25. The method of claim 16, wherein the fluid delivery apparatus comprises a
2 pressure valve to equalize pressure in the container.

1 26. The method of claim 16, wherein the fluid includes a dye.

1 27. The method of claim 26, where the dye is a naphthalimide.

1 28. The method of claim 16, wherein the apparatus further comprises a suction tube
2 fluidly connected to the channel.

1 29. The method of claim 28, wherein the suction tube extends from the channel,
2 through the input port and into a container.

1 30. The method of claim 16, wherein the container is sealable to the input port.
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1 31. The method of claim 16, wherein the apparatus further comprises:
2 an internal volume formed by sealing the container to the input port; and
3 a pressure valve in fluid communication with the internal volume.

1 32. The method of claim 29, wherein the container has a height of 135 mm, and an
2 outer diameter of 50.8 mm, and the suction tube has an outer diameter of 6 mm and a length
3 of 162.8 mm with a 16° bend from vertical directed towards the output port starting at 71.25
4 mm from a fluid receiving end of the tube.

1 33. The apparatus of claim 29, wherein the container has a height of 100.9 mm, and
2 an outer diameter of 42.5 mm, and the suction tube has an outer diameter of 6 mm and a
3 length of 124.2 mm with a 16° bend from vertical directed towards the output port starting at
4 55.2 mm from a fluid receiving end of the tube.

1 34. The apparatus of claim 29, wherein the container has a height of 73.0 mm, and an
2 outer diameter of 35.3 mm, and the suction tube has an outer diameter of 6 mm and a length
3 of 102.2 mm with a 16° bend from vertical directed towards the output port starting at 42.2
4 mm from a fluid receiving end of the tube.

1 35. A method for introducing fluid into a heating, ventilating, or air conditioning
2 system comprising:

3 filling a container with a fluid including a dye;
4 threadably connecting the container to a fluid delivery apparatus, the fluid delivery
5 apparatus including:
6 a body having a cavity, an output port fluidly connected to the cavity, an input
7 port fluidly connected to the cavity by a channel, and a piston orifice
8 fluidly connected to the cavity;
9 a piston extending into the cavity through the piston orifice;
10 an intake valve within the channel;
11 an output valve proximate to the output port; and
12 a pressure valve between the intake valve and the input port;
13 moving the piston out of the cavity to create lower pressure in the cavity, which
14 draws fluid from the container into the cavity and reduces pressure in the container;
15 attaching the output port to the fluid system with a connector;
16 moving the piston into the cavity to decrease volume in the cavity and cause the fluid
17 in the cavity to flow from the cavity through the output valve and pass through the output
18 port; and
19 equalizing pressure within the container to ambient pressure.

1 36. The method of claim 34, wherein attaching the container to the fluid delivery
2 apparatus includes threadably connecting the container to a threaded input port of the fluid
3 delivery apparatus.

4 37. The method of claim 35, wherein the threaded input port is threaded at a thread
5 density of 8 threads per inch, and has an inner diameter of 22 mm and a thread diameter of
6 24.1 mm.